Food Thrift

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Food an Index to the Cost of Living

Whenever people become troubled by the high cost of living it is the cost of food which occupies the first and foremost place in their minds. Expenditures for clothing and for housing, the other chief items of cost in our merely physical struggle with the environment, come at relatively infrequent intervals as compared with those for victuals and drink, to use the old forth right phraseology. Every day one must buy his bread, and the sad fact of rising prices impresses itself with a vigor and depth which presently becomes soul-stirring. On the other hand, the common man buys his "new suit" so infrequently, and the purchase is furthermore such an adventure in itself, and one in which one wants to make a brave showing of being a regular man of the world, that a 50 or even 100 per cent advance in the price over what the last similar spree cost is met with substantial equanimity. During the war, prices of clothing in this country rose out of all proportion to the prices of food, but the public clamor about high prices virtually all centered around the latter.

There is real justification for this point of view also in the fact that in the maintenance of a family, food expenditure constitutes relatively a very large item. This has been most recently and thoroughly discussed by Professor William F. Ogburn[1] from whose paper the data of the following table[2] are taken as illustrative of the facts at the present time:

Table I

Cost of Actual Yearly Consumption of Food Yielding Approximately 3500 Calories per Man per Day (Data from Ogburn)

Locality	Average Expenditure for Food	Average Total Annual Expenditure for All Purposes	Equivalent Adult Males
New York	$678.73	$1,470.20	3.33
Providence	647.00	1,448.28	3.34
Boston	628.92	1,310.20	3.34
Chicago	613.10	1,514.00	3.30
San Francisco and Oakland	605.40	1,414.15	3.34
Seattle	588.76	1,587.30	3.35
Denver	569.23	1,357.13	3.35
St. Louis and East St. Louis	567.37	1,422.39	3.35
New Orleans (white)	564.76	1,368.37	3.34
Atlanta	526.00	1,342.07	3.37
Minneapolis and St. Paul	485.29	1,359.96	3.35
New Orleans (colored)	449.00	965.30	3.35

The significance of the column headed "Equivalent adult males" is to show that all the data were from families of approximately the same size so far as food needs are concerned.

Further data discussed by Ogburn show that at present price levels the

[1] Ogburn, William F. *A Study of Food Costs in Various Cities. Monthly Labor Review*, Vol. IX, pp. 303–327, August, 1919.

[2] *Loc. cit.*, p. 312.

expenditure for food constitutes, for constant size of family, from 28 to 38 per cent of incomes of $2,100 per year, and from 39 to 50 per cent of incomes of $900 a year, with intermediate percentages for intermediate incomes. It is no wonder that the problem of merely living has become an extremely acute one for many people in this country.

What is the way out? Any thoughtful student of economic forces in this country knows that it is not in the direction of a lowered price level, at least in the immediate future, particularly so far as food is concerned. The producer of food has economically come into his own during the war, and is not going to submit complacently to any marked lowering of the price level of *his* commodities at once. And in his power to curtail production he has, of course, an economic weapon of first magnitude. But in the practice of true thrift in regard to food expenditures the consuming public of this country has ready at its hand a means of coping with this problem which is also of the greatest significance and economic power. The remainder of this paper will be devoted to the task of demonstrating this proposition and endeavoring to show ways and means.

PER CAPITA FOOD CONSUMPTION

The first point to be considered in an analysis of the situation is to get reliable figures as to the normal per capita food consumption of the people of this country. I have recently made an extensive and thorough statistical investigation[3] of this subject, and from that study I wish to present certain results here. In the first place, it should be said that the basis of any adequate survey of food resources or consumption must be essentially physiological, rather than one of commodities or trade. Broadly speaking, the ultimate sources of food are the soil and the sun. The energy derived from the sun through the mechanism of the green plant builds up the inorganic chemical elements of the soil, air, and water into compounds which can be utilized as food by man, either directly or secondarily in the form of the products of animals which have been nourished on the primary foods of the plant world. Furthermore, food must be expressed, for proper statistical treatment, in the ultimate chemical or physiological nutrient components, protein, carbohydrate, and fat, with of course the energy value in calories.

Table II gives in chemical nutrients the food consumption of the United States on a total and per capita base, for a period of seven years between July 1, 1911 and June 30, 1918. Before entering on the detailed discussion of per capita consumption figures in Table II it is well to recall a fact which is liable to escape attention, unless special attention is called to it. This is the fact that the final figures in Table II, which are called "consumption figures," really include something more than consumption in a nutritional sense. They include the food actually eaten plus that which is wasted by loss in cooking, in garbage, etc. It is necessary to be entirely clear on this point.

[3] Cf., Pearl, R. *The Relative Contribution of the Staple Commodities to the National Food Consumption. Proc. Amer. Phil. Soc.*, Vol. LVIII, pp. 182–222, 1919. A detailed account of the research is in press in book form, under the title *The Nation's Food* (W. B. Saunders Co., Philadelphia) and will shortly appear. In the meantime, it is necessary to ask the reader to take on faith the statement that the utmost critical care was taken to ensure the greatest attainable degree of accuracy in the final figures.

In calculating the nutrients in the intermediate calculations use has been made of factors which allowed for *inedible* refuse, so that all of the inedible portion of the foods as produced or imported have already been deducted in the calculations up to this point. Furthermore, gross losses from storage, spoilage, transportation, etc., have been deducted. Even after all these deductions have been made, however, it is obvious that there is still a considerable amount of loss and wastage of strictly edible material, which might be saved and consumed under a theoretically ideal system of preparing food for the table plus a conscientious ingestion of every bit of edible material. Of course, as a matter of fact, neither of these theoretically ideal conditions at all prevail. There is a considerable loss of nutrient values in the process of cooking as ordinarily practiced. This loss is undoubtedly greater for fats than for any other of the nutrients. It is a troublesome and time-consuming process for the housewife to conserve and utilize all of the fat which gets melted and floats about in the water in which foods are cooked, or adheres to the utensils in which they are cooked. Nor, in the minds of most people, is there any necessity or desirability of saving this fat. In fact, a great many people in this country object very strongly to what they designate as "greasy cooking." Consequently, floating fat of soup stock is skimmed off and thrown away in the vast majority of instances. The result is that in calculations made in the way those of this study have been made, which include the total nutrient value in the edible portion of food materials, after deducting inedible waste and the losses which accrue up to the time the food reaches the consumer, there is bound to be an apparently high consumption of fats. The figures here presented are really statements of consumption plus edible waste and should be so regarded.

Another important factor is that of edible waste in garbage, that is to say, the uneaten portion of the prepared food which is edible and might be consumed, but is not for reasons of taste, over-estimation of ingestive capacity, etc.

Looking at the matter from the na-

TABLE II

Consumption per Adult Man

Year	Protein		Fat		Carbohydrate		Calories	
	Per Annum (Kilos)	Per Day (Grams)	Per Annum (Kilos)	Per Day (Grams)	Per Annum (Kilos)	Per Day (Grams)	Per Annum	Per Day
1911–12	44.70	122	62.12	170	195.48	536	1,563,450	4,283
1912–13	44.04	121	60.44	166	198.68	544	1,558,232	4,269
1913–14	45.08	124	60.22	165	209.25	573	1,591,621	4,361
1914–15	43.05	118	63.42	174	193.42	530	1,560,326	4,275
1915–16	44.48	122	61.22	168	200.48	549	1,574,621	4,314
1916–17	43.01	118	62.45	171	189.94	520	1,536,833	4,211
1917–18	43.14	118	62.47	171	195.34	535	1,559,661	4,273
Average, whole period	43.91	120	61.78	169	197.45	541	1,565,075	4,288
Average, 1911–12 to 1916–17	44.05	121	61.65	169	197.82	542	1,566,032	4,290

tional point of view, it seems probable that of the protein in human foods left in the country for consumption in the statistical sense, it is safe to say that 5 per cent is lost in edible wastage; of the fat left in the country for consumption as human food, it is believed that at least 25 per cent is lost through wastage. This figure seems large, but it probably under-estimates rather than over-estimates the fact. Of the carbohydrates, probably there is 20 per cent of edible wastage.

Applying the estimated percentage deductions for edible wastage stated above to the per capita average for the whole period we have the following results for ingested human food:

114 grams protein per man per day
127 grams fat per man per day
433 grams carbohydrate per man per day
3424 calories per man per day

These figures are probably very close to the fact as regards protein and carbohydrate. They are perhaps somewhat too high still as regards fat, because the edible wastage of this component is higher than the 25 per cent used. The intention, however, has been to use the most conservative figures in estimating waste.

The stability of food consumption, in physiological units, one year with another is one of the striking things brought out by Table II. People consume about the same total amount year in and year out, so far as we may judge both from common experience and from careful statistical study. This stability of consumption is shown graphically in Figure 1.

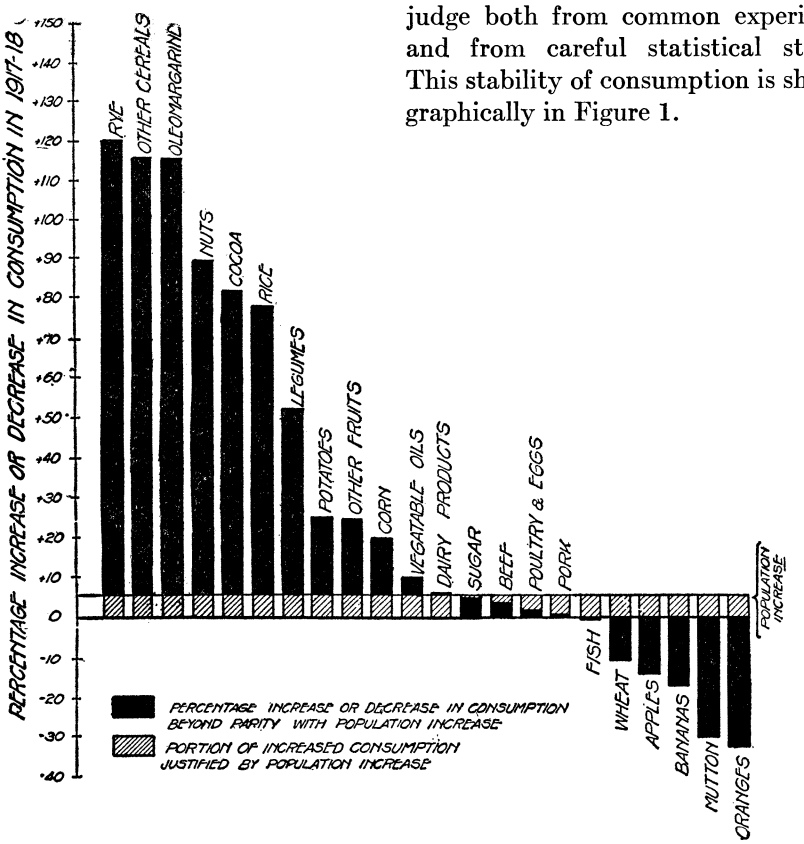

FIG. 1. DIAGRAM SHOWING THE ENERGY VALUE IN CALORIES OF THE GROSS CONSUMPTION OF HUMAN FOOD, PER ADULT MAN PER DAY

REDUCTION OF FOOD BILL BY THRIFT

It has been pointed out above that in the consumption calculations deductions were made for inedible refuse, for loss by spoilage, in transportation, storage, etc. Specifically these deductions included the following classes:

(a) Loss of commodity in storage
(b) Spoilage of commodity in storage
(c) Loss of commodity in transit
(d) Spoilage of commodity in transit
(e) Loss by vermin
(f) Amount fed to livestock
(g) Amount used for technical, non-food purposes, including the manufacture of alcoholic beverages
(h) Inedible refuse

From the viewpoint of thrift, rather than that of pure statistics, it must be remembered with the utmost clarity and precision, that the consuming public *pays for all these losses*. The prices of the commodities actually bought by the public include in themselves an allowance for all of these items. In the case of inedible refuse this is apparent. One knows that he pays for the rind of a watermelon, or the bone in a ham. He is not so apt to remember that he pays for the corn and wheat the rats eat.

So here, then, in items (a) to (g) above, is the first clearly marked place at which, from a national viewpoint, the practice of thrift would inevitably effect a reduction in the country's food bill, which in absolute amount would be literally enormous.

Again, it was pointed out in the preceding section that after all the deductions under items (a) to (h) inclusive had been made, there still was a large amount of *edible* waste thrown away in the form of garbage, and lost in cooking, etc. It is possible to give some definite figures on the effect which thrift can have on the reduction of this edible wastage. In the summer of 1917 Mr. Herbert Hoover, working through the organization he had built up, which was later to become the United States Food Administration, organized a nation-wide campaign to urge people to avoid waste in the preparation and use of food. In order to check up on the effectiveness of this campaign statistics[4] were collected from 96 cities monthly, giving the amount of the collection for each month in 1917–18, while the conservation campaign was on, and the corresponding month in 1916–17, before any conservation was practiced. The summarized totals are exhibited in Table III.

TABLE III

Total Tons of Garbage Collected in 96 Cities, by Months, May 1916 to April 1918

	Garbage Collected (Tons)		
	1917–18	1916–17	Relative
May	191,129.06	226,066.56	85
June	209,937.90	230,724.72	91
July	233,853.45	245,198.66	95
August	265,409.63	278,948.91	95
September	241,317.59	258,751.64	93
October	220,943.29	234,148.73	94
November	190,012.89	209,090.07	91
December	170,391.67	200,067.75	85
January	156,711.35	200,096.45	78
February	148,785.15	167,391.84	89
March	177,392.25	181,306.00	98
April	183,119.69	177,342.50	103
Totals	2,388,931.92	2,609,133.83	92

It will be seen at once that a substantial reduction in amount of garbage was effected simply by voluntary care and thrift on the part of the people. But even more remarkable than this quantitative saving, great as it was, was the qualitative saving, as indicated by the amount of fat in the garbage. In a number of large cities there are garbage reduction plants, where the grease is extracted from the garbage and sold. Table IV gives the results in this particular for 12 cities.

[4] Pearl, R. *Statistics of Garbage Collection and Garbage Grease Recovery in American Cities. Jour. Ind. Eng. Chem.*, Vol. 10, p. 927, 1918.

TABLE IV

Tons of Garbage Grease Recovered in 12 Cities for the Two Years, May 1917 to April 1918 and May 1916 to April 1917

City	Population	Tons of Garbage		Tons of Grease Recovered			Percentage of Grease		
		May 1917–Apr. 1918	May 1916–Apr. 1917	May 1917–Apr. 1918	May 1916–Apr. 1917	Relative Figure	May 1917–Apr. 1918	May 1916–Apr. 1917	Relative Figure[b]
Boston, Mass.	781,628[a]	46,335	52,650	1,401	2,140	65	3.02	4.06	74
Buffalo, N. Y.	468,558	15,382	21,817	314	494	63	2.03	2.26	90
Chicago, Ill.	2,497,722	93,235	124,496	1,656	2,869	58	1.77	2.30	77
Cleveland, Ohio	674,073	55,466	59,708	1,415	1,821	78	2.55	3.05	84
Columbus, Ohio	220,000[a]	17,295	20,393	354	639	55	2.04	3.13	65
Dayton, Ohio	155,000[a]	15,677	16,621	250	355	70	1.59	2.13	75
Indianapolis, Ind.	271,758	19,929	23,267	454	793	57	2.27	3.40	67
New Bedford, Mass.	118,158	8,774	10,162	199	270	74	2.26	2.65	85
Pittsburgh, Pa.	579,090	72,612	73,758	1,554	2,117	73	2.14	2.87	75
Philadelphia, Pa.	1,709,518	114,160	101,678	1,178	1,161	101	1.03	1.14	90
Schenectady, N. Y.	105,000	4,111	4,419	84	91	93	2.04	2.04	100
Wilmington, Del.	94,265	18,986	14,187	49	92	53	0.25	0.65	38
Totals	7,684,771	481,962	523,156	8,906	12,843	70	1.85	2.45	76

[a] Population, 1918. [b] Relative figure expressing the monthly collection for 1917–18 as a percentage of that of the same month of 1916–17; that is, relative figures under 100 mean smaller collections and figures over 100 mean larger collections.

Tables III and IV make plain in a concrete way what thrift can do on a large scale. A reduction of about 10 per cent in the gross tonnage of garbage, and of 30 per cent in the tonnage of fat recovered can only have been accomplished by a real and widespread saving and utilization of food materials which ordinarily go into the garbage can.

GENERAL STABILITY OF FOOD CONSUMPTION

Table II and Figure 1 indicate how difficult, not to say impossible, it would be to lower by any substantial amount the gross total food intake of a nation's population, so long as there is an abundance available. The experience of every country in the war shows that despite regulations, however drastic, and propaganda for voluntary reduction of the intake, people will eat just about the same total amount, *if they can get it.* They *can* be induced to stop wasting, and to save edible material which would otherwise go into the garbage can. Also, if there is an actual shortage of all foods, as was the case in Germany during the war, the total calory intake will be perforce reduced. But in the presence of plenty all experience goes to show that the food consumption of any nation, per capita of population, is exceedingly stable over long periods of time.

From the standpoint of true thrift it is desirable that such stability of consumption should obtain. The human body is a machine. Food is its fuel. If the machine is to maintain a given output of energy it must consume a given proper amount of fuel. To try to make the machine perform on a reduced fuel consumption, below the level which human experience through centuries has shown to be the optimum for efficient performance,

would be the height of folly, so long as adequate supplies are available. The human machine is so delicately organized that there is every reason to believe that if the nation's total calory intake were to be reduced by so small an amount as 10, or even 5, per cent over a period of months the results would be promptly apparent in increased mortality rates, diminished output of industry, and greatly increased morbidity.

The points which were stressed in Mr. Hoover's Food Administration conservation campaign seem to point the way to true and sound food thrift more wisely and justly than has ever been done before. These points were essentially:

1. *General conservation*, by the elimination of waste of edible materials wherever and however possible. The effectiveness of this has been demonstrated by the garbage figures, to take but a single instance. Many others might be given.

2. *Special conservation*, by substitution of one food material for another which it was desired to save for essentially military purposes. This was the method taken to conserve a short wheat supply.

The effectiveness of this special conservation is well shown in Figure 2.

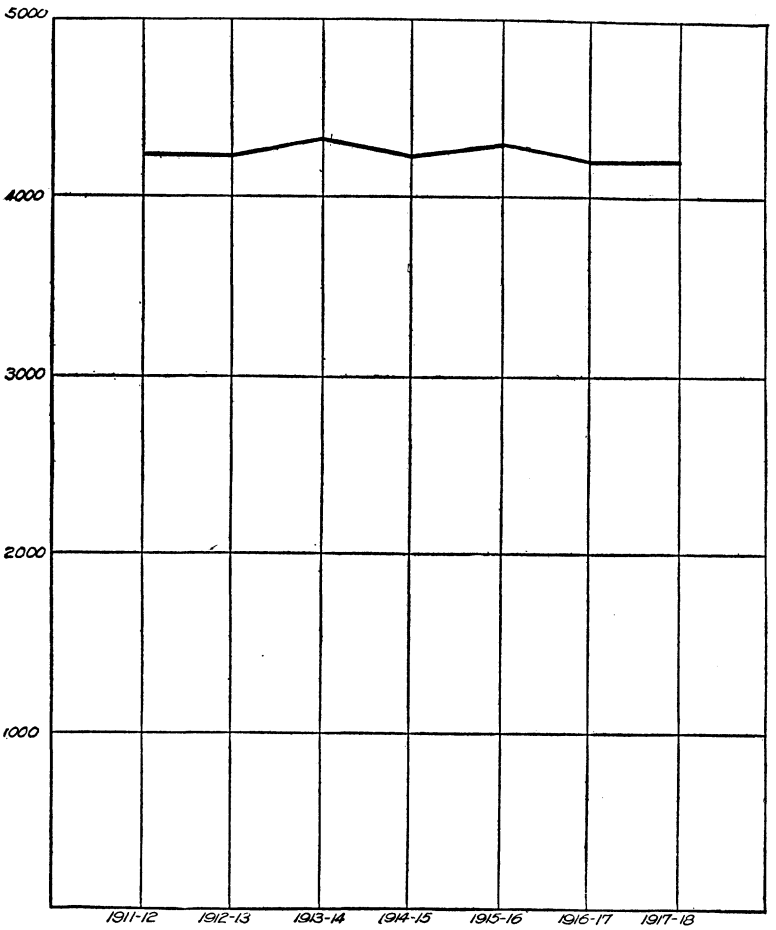

FIG. 2. SHOWING THE PERCENTAGE INCREASE OR DECREASE IN CONSUMPTION IN 1917–18 AS COMPARED WITH THE ANNUAL AVERAGE OF THE SIX YEARS PRECEDING. FOR EXPLANATION SEE TEXT

In this diagram the total length of the bars from the 0 line shows the total percentage increase or decrease in consumption in 1917–18 as compared with the preceding six years. The cross-hatched portion of each bar shows the percentage increase in population, and therefore the part of the increased consumption to be expected as a result of population increase. Where the black bar is below the top of the cross-hatched population bar it means a conservation. Thus the true conservation on wheat amounted to $10.80+5.73=16.53$ per cent of the normal average consumption.

It will be noted at once that the commodities showing great increases in consumption in 1917–18 over the preceding years are, for the most part, those which the Food Administration urged to be substituted for articles of which the supply was less abundant, and for which the needs of the Allies were greater. Thus, rye, which constituted the most popular of the substitutes for wheat in the public mind, shows the greatest increased consumption in 1917–18. Next to it stands the "Other cereals" of our classification, including barley and buckwheat. Nuts, rice and the vegetables generally show increases beyond the population increase, showing that the people very generally followed the suggestions of the Food Administration to consume more of these products and save wheat. The articles on which the Food Administration most strongly urged conservation—namely, wheat, beef, mutton, pork, and the sugars—all show either a consumption actually below the normal average, or else a very slight absolute increase well below the population percentage increase. In either case a real and substantial conservation is, of course, shown. The decrease in consumption of the most popular fruits, oranges, apples, and bananas is largely if not entirely explained by high prices for these products.

The health and efficiency of the American people did not suffer in the slightest degree from these food substitutions. There is no reason why the same method cannot be voluntarily applied by the people in peace as well as in war, and for economic as well as military motives. During the past summer I have had the privilege of visiting and talking over the economic situation with a considerable number of the largest manufacturers of all kinds of food products, from the Atlantic to the Pacific Coast. The outstanding general result of this experience, to which the supporting testimony was virtually unanimous, was that the demand for the highest grade of fancy products, put up in the most expensive way in the most costly packages, was greater than could be supplied; while on the other hand, standard grades of which the food value was just as great, but the price lower, were difficult to dispose of. And yet during this very period there was great public clamor, coupled with activity about equally furious and futile on the part of our legislators, regarding the high cost of living in general and of food in particular. It costs a manufacturer a definite and substantial excess amount to produce a highly fancy food product. But the product contains no more protein, or fat, or carbohydrate, or calories than does a standard article (sometimes indeed less), nor is the fancy grade any more sanitary, broadly speaking. Yet people are loath to buy any food except what they call

TABLE V

Cost of Food in Relation to Its Energy Value

Order	Commodity	Average Retail Price per Lb. (Cents)	Relative Cost of 100 Calories, Bread Being Taken as 100		
			Oct. 1 1918	Sept. 1 1918	Aug. 1 1918
1	Cornmeal	7.05	52	51	51
2	Flour, graham	7.2	53	53	51
3	" wheat	7.3	54	54	53
4	" rye	7.2	54	56	54
5	Oats, rolled	8.4	55	57	52
6	Flour, barley	7.9	57	59	59
7	" corn	8.1	59	57	56
8	Hominy grits	9.1	67	67	65
9	Sugar, granulated	10.4	68	62	61
10	Sirup, corn	8.6	71	72	68
11	Flour, buckwheat	11.2	82	80	73
12	" rice	13.4	95	91	89
13	Barley, pearled	13.2	97	96	85
14	Bread	9.9	100	100	100
15	Lard, pure leaf	34.9	102	97	95
16	Rice, fancy head	13.7	103	100	96
17	Oil, cottonseed	34.7	104	114	106
18	Macaroni (bulk)	15.0	110	109	104
19	Oil, corn	37.6	113	123	103
20	Beans, navy	16.9	128	113	117
21	Oleomargarine	37.1	130	124	122
22	Raisins, seeded	15.6	133	130	128
23	Crackers, oatmeal	21.6	134	142	141
24	" graham	21.7	136	144	139
25	Potatoes, white	3.73	148	151	149
26	Cocoa (bulk)	33.7	179	161	166
27	Prunes, medium	17.5	180	175	169
28	Peaches, evaporated	18.9	188	183	167
29	Apples, "	20.8	188	192	180
30	Potatoes, sweet	7.1	188	225	236
31	Cheese, American Cheddar	37.5	215	203	195
32	Butter, creamery	63.5	217	184	176
33	Milk	6.85	264	248	245
34	Honey, comb	33.7	272	243	240
35	Onions	5.2	310	340	336
36	Ham, sliced	51.4	323	306	293
37	Mackerel, salt	27.3	326	305	309
38	Oil, Italian olive	110.0	328	324	295
39	Corn, canned	14.88	403	388	375
40	Pork chops	43.5	422	389	366
41	Leg of mutton	35.3	484	487	473
42	Salmon, Red Alaska canned	30.8	557	548	537
43	Salmon, fresh	32.4	604	611	546
44	Beef, round steak	38.1	699	692	681
45	Peas, canned	15.04	718	699	675
46	Eggs, fresh gathered	36.2	720	635	586
47	Halibut steak	32.3	856	864	782
48	Peaches, canned	15.9	903	903	793
49	Cod, salt	27.6	915	955	839
50	White fish	26.2	977	962	837
51	Tomatoes, canned	14.0	1,671	1,623	1,582
52	Beans, string, canned	15.7	2,082	2,015	1,705

the "best." A point which wants emphasizing is that thrift, like Boston, is a state of mind.

FOOD IN RELATION TO ENERGY VALUE

To give point and direction to thoughts similar to those expressed in the preceding section it was the writer's custom during his connection with the Food Administration to issue monthly a typewritten bulletin, to members of the organization for publicity use, having the title "Cost of Food in Relation to Its Energy Value." A sample table from one of these bulletins (that for October 1, 1918) is reproduced here as Table V. The table gives the relative cost of 100 calories obtainable from various foods at the average retail price prevailing in the United States on the dates named.

Such tables as this can be prepared very simply and easily by anyone with an elementary grasp of arithmetic. They should form one of the essential bases and guides of food thrift. Canned string beans no doubt have their place in the dietary of the rich, but it is difficult to see what place they have in the practice of food thrift.

PREREQUISITES TO PRACTICE OF THRIFT

By way of summary it may be said that in the opinion of the writer preaching the virtues of thrift is much like any other sort of preaching, a sadly thankless and ineffective task. What I have tried to do in this paper, in lieu of exhortation, is to present some basic facts about the physiology and economics of food, and to point out how any people thriftily minded may reduce their national food bill much below what ours is and suffer no evil consequences, but only good. The way lies along two lines, which are: First, reduction of avoidable waste of food at every stage from the farmer's field to the consumer's stomach; and second, the substitution of cheap foods, physiologically just as nourishing, for dear foods. But first of all, and all the time, it is a prerequisite to the practice of thrift, that the people be thriftily minded.